AUSTRALIAN HESPERIIDAE. Part i.

Notes and Descriptions of New Forms.

By G. A. Waterhouse, D.Sc., B.E., F.E.S.

(Plate xxvi.)

[Read 31st August, 1927.]

Since "The Butterflies of Australia" was published in 1914, further collecting has resulted in records of many new localities together with several new forms of skippers; the more important of these are given in the present paper.

Subfamily Trapezitinae.

Watson (*P.Z.S.*, 1893, p. 71) places the species I include in the Trapezitinae in Section A of his subfamily Pamphilinae, and remarks (p. 69) that they are somewhat aberrant, and in his key (p. 71) puts the Australian genera in a group distinct from the other genera of his subfamily Pamphilinae. As this group of Australian genera is confined to Australia, New Guinea and the neighbouring islands, a new subfamily was proposed for them. In "The Butterflies of Australia" 51 species of this subfamily were placed in ten genera and it was pointed out (p. 175) that when the life-histories of the species became known, further distinctions would be found. By careful searching I have found some portion of the early stages of 20 species and as the result of a study of these, I have found it necessary to alter the sequence of the genera.

The early stages may be divided into three groups: (*a*) Larva with head large, hard, rough, some shade of brown without any conspicuous markings; body some shade of brown, often with a pinkish tint and somewhat rough; pupa stout, with the anterior end smooth without any prominent projection. Here are placed the genera *Trapezites*, *Anisynta*, *Signeta*, *Dispar* and *Toxidia*. (*b*) Larva with head large, hard, black, covered with long white hairs; body white, hairy; pupa without prominent projections at anterior end. Only *Mesodina* comes here. I know the life-histories of *halyzia* and *aeluropis*, both of which pupate head downwards. (*c*) Larva with head large, hard, pale with a dark brown or black band almost encircling the head in front; body smooth, pale green or yellowish, outer skin very transparent; pupa longer than those of (*a*), cylindrical, tapering towards posterior end, always with a prominent projection at anterior end, sometimes this projection is long and bifid and varies considerably in the different species. *Hesperilla* and *Oreisplanus* come into this section, which, from their larval characters, are allied to those Australian species of the genera *Taractrocera*, *Padraona* and *Telicota*. The only genus of Trapezitinae omitted is *Neohesperilla* and of the early stages of its species, I know nothing at present.

From the various characters I would now place the genera in the following order: *Trapezites*, *Dispar*, *Signeta*, *Anisynta*, *Toxidia*, *Mesodina*, *Neohesperilla*,

Motasingha, *Oreisplanus* and *Hesperilla*. The larval and pupal characters confirm the slight imaginal characters used in separating *Toxidia* and *Hesperilla*.

It is very difficult to draw up satisfactory descriptions of the species in the Trapezitinae, as though they appear very distinct in the cabinet, the markings above are very similar and similarly placed, so the descriptions of the upperside are very much the same. The underside of the hindwing always shows the chief distinctions and the apex of the forewing beneath is always coloured in the same manner as the hindwing beneath.

TRAPEZITES ELIENA Hewitson.

Hesperia eliena Hew., *Desc.* 100 *new Hesp.*, p. 32, 1868 (Moreton Bay); *Trap. eliena* Herr-Schff., *Stett. Ent. Zeit.*, 1869, p. 80, pl. iii, fig. 13 (Brisbane); *Telesto caecilius* Plötz, *Stett. Ent. Zeit.*, 1884, p. 380 (India in error); *Trap. iacchus* Meyr. and Lower (*nec* Fabr.) *Trans. Roy. Soc. S. Aust.*, 1902, p. 87; *Trap. eliena* Waterh. and Lyell, *Butt. Aust.*, p. 176, figs. 604, 605, 1914.

From the large number of specimens available, I can distinguish two good subspecies.

TRAPEZITES ELIENA ELIENA Hewitson.

I possess many specimens from the type locality, Brisbane, and also from Kuranda, Westwood and Gayndah in Queensland, Richmond River, Sydney, and Blue Mountains in New South Wales. In these the general colour of the apex of the forewing and the whole of the hindwing beneath is orange brown in the males and very slightly paler in the females. The spots on the hindwing beneath are sometimes reduced to small black dots without whitish centres, but the discal row are never absent; when reduction takes place the central spot is also reduced in size.

TRAPEZITES ELIENA MONOCYCLA Lower.

Trans. Roy. Soc. S. Aust., 1911, p. 139; *Trap. iacchus* And. and Spry (*nec* Fabr.) *Vict. Butt.*, p. 115, figured, 1893.

I have examined the type from Mt. Gambier, S. Aust., and also the specimens from Victoria in the National Museum, Melbourne and in Mr. Lyell's collection and consider this a southern subspecies, characterized by the apex of the forewing and the hindwing beneath being almost yellow. The central white spot of the hindwing beneath is always large and the discal row of four spots reduced in most cases to mere dots, sometimes absent as in Lower's type. I have 6 ♂ and 4 ♀ from Victoria (Gisborne, Fernshaw and Mordialloc) all of which can be recognized from northern specimens by the underside, though in no case have the discal spots entirely disappeared. I would restrict the name *monocycla* to S. Australia (type) and Victoria. I have not seen a specimen of *eliena* from Tasmania.

TRAPEZITES IACCHOIDES Waterhouse.

This rare species has been taken at Barrington Tops in December by Messrs. Goldfinch and Burns. The specimens differ slightly from Sydney specimens, being much brighter in colour.

TRAPEZITES PHIGALIOIDES Waterhouse.

I have taken this species at French's Forest, near Sydney, in October.

SIGNETA TYMBOPHORA Meyr. and Lower.

This very local species was sent to me by Mr. E. J. Dumigan from Bunya Mts., Qld. (Jan., 1926). This is a new record for Queensland, the species hitherto having been found only in the Illawarra District, New South Wales.

ANISYNTA SPHENOSEMA Meyr. and Lower.

I found several larvae in King's Park, Perth, W. Aust., in September and succeeded in rearing a specimen which emerged in Sydney in March. The larvae and pupae are very similar to those of *Trapezites*.

ANISYNTA TILLYARDI Waterhouse and Lyell.

The range of this species has been extended from the type locality (Ebor, N.S.W.) to Bunya Mts., Qld. (E. J. Dumigan, Jan.), Murrurundi (Febr.), and Barrington Tops, N.S.W. (Jan., G.A.W.).

ANISYNTA TASMANICA Miskin.

Additional localities in New South Wales at which I have caught this species are Stanwell Park (near sea level, Mar.), Blackheath (Nov.) and Barrington Tops (Jan. and Febr.).

TOXIDIA MALINDEVA Lower.

Taken at Westwood, Qld. by Mr. A. N. Burns in September and October.

TOXIDIA CRYPSIGRAMMA Meyr. and Lower. (Plate xxvi, fig. 20, ♂, 19, ♀.)

Mr. A. N. Burns has taken this species at Westwood, Qld., in February, September and October, including a single specimen of the undescribed female.

♀. ABOVE. Forewing dull brown; two small subapical elongate spots, whitish; discal spots in areas 2 and 3 and a small discal spot above vein 1, whitish; cilia grey-brown. Hindwing grey-brown; cilia greyish.

BENEATH. Forewing pale grey-brown at apex, brown in cell and on disc, greyish near tornus, spots as above, but fainter; cilia greyish, slightly darker at terminations of veins. Hindwing pale grey-brown; cilia as in forewing.

This specimen was taken at Westwood in August, and is in Coll. Burns. This species is easily distinguished from the larger *T. peroni* and *T. malindeva*, both of which have a spot in cell of forewing and have the hindwing marked beneath. It is nearest *T. sexguttata*, which is a narrower winged species and has the hindwing beneath a different shade of brown without markings. Males from Westwood as well as the two from the type locality (Herberton) are larger than those Mr. R. Illidge has sent me from Brisbane.

TOXIDIA SEXGUTTATA Herrich-Schaeffer.

Mr. L. Franzen has given me a female from Palmwoods, S. Queensland (Febr.), which is much darker than the five I have from N. Queensland.

MOTASINGHA MONTICOLA Olliff.

New localities are near Gisborne, Vict. (Lyell, Mar.), and Jenolan Caves, N.S.W. (L. H. Moss-Robinson, Febr.). Though I have visited Mt. Kosciusko each month from December to March, I have never seen this species there, probably as I collected only above 5,000 ft. Prof. L. Harrison has given me two specimens caught at 4,000 ft. in February.

it as such. Meyrick and Lower were quite right in placing *cyclospila* near *donnysa*, and it may possibly be a subspecies of it, whilst the specimen given as fig. 632 is certainly closer to *chrysotricha* M. and L. *H. donnysa* has a more pointed forewing (especially in the male) than *chrysotricha* and its allies.

The four races of *H. donnysa* may be distinguished as follows:—

HESPERILLA DONNYSA DONNYSA Hewitson. (Plate xxvi, figs. 1, 2, 6.)

♂. ABOVE. Forewing dark brown, with six hyaline yellowish spots, one large in cell, three small subapical and two beyond the sexmark, an opaque yellow spot above middle of vein 1; base faintly dusted yellowish. Hindwing dark brown, with a large dull orange spot divided by the veins.

BENEATH. Forewing with apex grey suffused lilacine, cell broadly pale yellow, transparent spots as above, dorsum whitish. Hindwing grey suffused lilacine, a small spot in cell and a discal series of six spots (five almost in a straight line), brown.

♀. ABOVE and BENEATH as in male, but all spots larger.

I would restrict the typical race to Brisbane, New South Wales and Eastern Victoria. In Exotic Butterflies, Hewitson gives a coloured figure of the upperside of the male. In "Butterflies of Australia", figs. 633 and 634 show this form.

I have 24 ♂, 14 ♀ from N.S.W., and 12 ♂, 13 ♀ from Victoria. In two males there are only two subapical spots and in seven males no opaque spot on the forewing above, in three females there is a second smaller opaque spot above the other. Beneath the general colour varies somewhat. On the hindwing beneath, the six discal spots are not always present, in 4 ♂, 7 ♀ the cell spot is white centred and in three other males and two other females some of the discal spots are white centred, this occurs more frequently in Victorian specimens.

HESPERILLA DONNYSA FLAVESCENS, n. subsp. (Plate xxvi, figs. 17, 18.)

♂. ABOVE. Forewing pale brown, almost wholly covered with yellow scales so that the six hyaline spots are not so transparent as in the type form; two small opaque spots above vein 1. Hindwing pale brown, dorsum covered with yellow scales, central spot yellow orange.

BENEATH. Apex of forewing and hindwing yellowish grey, cell spot and discal spots slightly white centred.

♀. ABOVE as in male with the three subapical spots much longer and a fourth below them; spot above vein 1 large and a smaller one above it. Hindwing with an obscure spot in cell and two beyond the large central yellow spot.

BENEATH as in male, all spots of hindwing white centred.

I have four specimens of each sex and there are others in the National Museum, Melbourne. One male and two females have a fourth subapical spot.

Locality: Altona Bay, Victoria, Mar., Apr. and Nov. (F. P. Spry).

HESPERILLA DONNYSA AURANTIA, n. subsp. (Plate xxvi, figs. 5, 21, 22.)

This form can be recognized by the large bright orange spot of the hindwing above, in most cases the cell spot of the forewing is larger and often in the male and usually in the female there are two opaque spots above vein 1, sometimes as in fig. 21 these two spots coalesce, rarely the subapical spots are connected by two small spots to the discal spots, thus forming a complete band from vein 1 to costa, broken only by the dark veins. Sometimes there are two obscure pale spots beyond the central spot of the hindwing above, in the female.

On the hindwing beneath the spots are larger but not so well defined. In five males and one female the cell spot is white centred and in a further one male and five females, one or more of the discal spots are centred white as well.

I possess 22 ♂, 13 ♀ from Tasmania from the following localities: Eaglehawk Neck, 2 Febr., 1910 (holotype ♂, fig. 22, allotype ♀, fig. 21, and two paratype males); Brunei Is., Dec.; Mt. Wellington, Jan., Febr.; Mt. Magnet, Jan.; Strahan, Febr.; Queenstown.

Hesperilla donnysa galena, n. subsp. (Plate xxvi, figs. 9, 10, 13, 14.)

♂. above. Forewing brown, basal half covered with yellowish scales; spot in cell, large, subapical spots usually four, two discal spots beyond sexmark, all transparent yellow; distad of cell spot a large black streak; sexmark irregular grey; cilia yellowish. Hindwing brown; dorsum covered with yellowish scales; a large central trifid spot, yellow; cilia yellowish.

beneath. Forewing with costa and apical third grey; transparent spots as above; a broad yellowish streak in cell; two yellowish spots above middle of vein 1; rest of wing black. Hindwing grey; central spot and discal series of six spots, silvery white, ringed with black.

♀. above. Forewing as in male, but spots larger; a large opaque spot above middle of vein 1 and a smaller one above it, yellow. Hindwing as in male, central patch, larger and brighter.

beneath as in male; spots of hindwing beneath usually larger.

This very distinct subspecies is described from holotype ♂, allotype ♀, and 9 ♂, 7 ♀ paratypes, which I bred from larvae and pupae found at Geraldton, W.A., in September, 1926. All but two males and one female (with three) have four subapical spots on the forewing and two males and one female have still another spot making almost a complete band from vein 1 to costa. Some males have opaque spot or spots above the middle of vein 1 of the forewing and six males and six females have the spots of hindwing beneath, silvery white. The sexmark differs in colour from the other races.

Hesperilla chrysotricha Meyrick and Lower.

This species is somewhat allied to *H. donnysa*, but the shape of the forewing is different. It is a much stouter-built insect. In all its subspecies the transparent spots of the forewing are paler than in *H. donnysa*. At one time I thought that it represented *H. donnysa* in W. Australia, but the male genitalia are different. I now recognize three subspecies, to one of which I had applied the name *H. cyclospila* in error.

Hesperilla chrysotricha chrysotricha Meyrick and Lower.

Toxidia chrysotricha Meyr. and Lower, *Trans. Roy. Soc. S. Aust.*, 1902, xxvi, p. 59.

The typical form from W. Australia has the apex of the forewing and the hindwing beneath dull red brown and the spots of hindwing beneath nearly circular and centred silvery white.

Hesperilla chrysotricha leucospila, n. subsp. (Plate xxvi, figs. 25-28.)

♂. above. Forewing brown, a small spot at end of cell, yellow hyaline; three small transverse subapical dots, pale yellow hyaline; a small discal spot in area 3, pale yellow hyaline; a narrow irregular discal sexmark from before vein 1 to

beyond vein 3; cilia grey brown. Hindwing brown; central patch, deep yellow; cilia grey.

BENEATH. Forewing brown; apex broadly brown; base of cell pale yellow; hyaline spots and dots as above; a large discal spot in area 2 and a divided spot in area 1 whitish; dorsum towards tornus yellowish. Hindwing brown; a spot in cell, dark brown centred silvery white; a series of discal spots, that of area 1, small, brown centred white, those in 2, 3 and 5 elongate, white bordered brown, two dark brown dots in area 4.

♀. ABOVE. Forewing brown; cell spot and subapical dots as in male; a large discal spot in area 3, a minute one in area 2, pale yellow hyaline; a discal spot above middle of vein 1 yellow; cilia grey brown. Hindwing as in male.

BENEATH. Forewing as in male; subapical spots larger. Hindwing as in male, white spots much larger; two dots in area 4 better defined.

Locality: Inverloch, Victoria. Holotype ♂, allotype ♀, paratype ♂ in National Museum, Melbourne, paratype ♂ in collection Waterhouse. Besides these four specimens, I have a female from Fernshaw, Victoria, and the South Australian Museum has a defective female labelled Sheringa, Port Lincoln district, 12:10:89.

This subspecies differs from the Western Australian subspecies, in being smaller. The markings above, particularly on the hindwing, are not so bright and the general colour is brown and not red brown. The spots of the hindwing beneath are twice the length of those of the type race. This subspecies must be very rare or very local. The figures are of the upper and undersides of the holotype and allotype.

HESPERILLA CHRYSOTRICHA PLEBEIA, n. subsp. (Plate xxvi, figs. 23, 24.)

H. chrysotricha cyclospila, Waterh. and Lyell (*nec.* Meyr. and Lower), *Butt. Aust.*, p. 188, fig. 632, 1914.

♂. ABOVE. Forewing brown; a small spot in end of cell, yellow, hyaline; three transverse subapical dots, pale yellow, hyaline; a discal spot in area 3 and a much smaller discal spot in upper edge of area 2, pale yellow, hyaline; cilia grey brown; a narrow discal sexmark. Hindwing brown; a small central patch, yellow; cilia grey brown.

BENEATH. Forewing brown; apex broadly dull brown; base of cell yellow; hyaline spots and dots as above, with that in area 2 much larger; dorsum towards tornus, whitish. Hindwing brown; a small spot in cell, dark brown centred silvery white; a series of small discal spots, dark brown, those in areas 1, 2, 3, and 5, centred silvery white.

Locality: Bridport, Tasmania, two males in December. Holotype in Coll. Lyell and paratype in Coll. Waterhouse. These two males were identified by Lower as *H. cyclospila*, but I have recently examined his type in Adelaide and find that they do not agree with it. They are smaller than the Victorian race and also paler. The female is unknown.

HESPERILLA CRYPSARGYRA Meyrick.

This species is nearest to *Hesp. picta*, but the apex of the forewing is not quite so pointed. The discovery by myself of a fine large and beautifully marked race at Barrington Tops extends its range considerably.

HESPERILLA CRYPSARGYRA CRYPSARGYRA Meyr. (Plate xxvi, figs. 3, 4, 7, 8.)

Telesto crypsargyra Meyr., PROC. LINN. SOC. N.S.W., 1887, p. 829; Waterh. and Lyell, *Butt. Aust.*, p. 186, figs. 600, 601.

On the forewing of the male of this subspecies there is rarely more than one discal hyaline spot and rarely traces of subterminal streaks above. On the female these spots are always much larger. The type locality is Blackheath, N.S.W. (3,500 ft)., and I have caught it as well at Katoomba, Wentworth Falls, and Woodford (2,000 ft.), all in the Blue Mts.

HESPERILLA CRYPSARGYRA HOPSONI, n. subsp. (Plate xxvi, figs. 11, 12, 15, 16.)

This is a much finer and larger race, almost equalling in size *Hesp. picta*. The spots of the upperside in both sexes are always larger and deeper in colour. On the underside of the forewing in both sexes the general colour is brown rather than red brown, the spots are orange rather than yellow and there is a broad orange streak along the upper edge of cell; on the hindwing the silvery markings are much larger and the veins are orange; the costa towards base is broadly orange.

I have named this fine form after my friend, Mr. J. Hopson, who has done so much to help entomologists to collect the treasures of Barrington Tops. Figure 11 is of a male bred in Sydney in October from an egg laid at Barrington Tops in February and placed on my plants of *Gahnia* growing in Sydney. Besides the holotype ♂ and allotype ♀ in my collection, I have a number of paratypes of both sexes caught and bred from the same locality in January and February. The foodplant is a species of *Gahnia* much coarser and paler in colour than the narrow-leaved species on which the typical race feeds in the Blue Mts.

Chief References to Australian Hesperiidae.

LOWER, O. B., 1911.—Revision of the Australian Hesperiadae, *Trans. Roy. Soc. S. Aust.*, xxxv, pp. 112-172.

MEYRICK and LOWER, 1902.—Revision of the Australian Hesperiadae, *Trans. Roy. Soc. S. Aust.*, xxvi, pp. 38-129.

MISKIN, W. H., 1891.—Synonymical Catalogue of the Butterflies of Australia. Annals of the Queensland Museum. No. 1.

WATERHOUSE and LYELL.—The Butterflies of Australia, pp. 172-224. All Australian species figured.

EXPLANATION OF PLATE XXVI.

1. *Hesp. donnysa donnysa*, ♀, Blue Mts., N.S.W., November.
2. *Hesp. donnysa donnysa*, ♂, Blue Mts., N.S.W., November.
3. *Hesp. crypsargyra crypsargyra*, ♂, Blue Mts., November.
4. *Hesp. crypsargyra crypsargyra*, ♀, Blue Mts., November.
5. *Hesp. donnysa aurantia*, ♂, Mt. Wellington, Tas.
6. *Hesp. donnysa donnysa*, ♂, Sydney, N.S.W., October.
7. *Hesp. crypsargyra crypsargyra*, ♂, Blue Mts., November.
8. *Hesp. crypsargyra crypsargyra*, ♀, Blue Mts., November.
9. *Hesp. donnysa galena*, ♀, Geraldton, W.A., September. Allotype ♀.
10. *Hesp. donnysa galena*, ♂, Geraldton, W.A., September. Paratype ♂.
11. *Hesp. crypsargyra hopsoni*, ♂, Barrington Tops, N.S.W., October. Holotype ♂.
12. *Hesp. crypsargyra hopsoni*, ♀, Barrington Tops, N.S.W., January. Paratype ♀.
13. *Hesp. donnysa galena*, ♀, Geraldton, W.A., September. Paratype, ♀.
14. *Hesp. donnysa galena*, ♂, Geraldton, W.A., September. Holotype ♂.
15. *Hesp. crypsargyra hopsoni*, ♂, Barrington Tops, N.S.W., February. Paratype ♂.
16. *Hesp. crypsargyra hopsoni*, ♀, Barrington Tops, N.S.W., February. Allotype ♀.
17. *Hesp. donnysa flavescens*, ♀, Altona Bay, Vict., April. Allotype ♀.
18. *Hesp. donnysa flavescens*, ♂, Altona Bay, Vict., November. Holotype ♂.
19. *Toxidia crypsigramma*, ♀, Westwood, Qld., August. Holotype ♀.
20. *Toxidia crypsigramma*, ♂, Westwood, Qld., October.
21. *Hesp. donnysa aurantia*, ♀, Eaglehawk Neck, Tas., February. Allotype ♀.
22. *Hesp. donnysa aurantia*, ♂, Eaglehawk Neck, Tas., February. Holotype ♂.
23. *Hesp. chrysotricha plebeia*, ♂, Bridport, Tas., December. Holotype ♂.
24. *Hesp. chrysotricha plebeia*, ♂, Bridport, Tas., December. Paratype ♂.

25. *Hesp. chrysotricha leucospila,* ♀, Inverloch, Vict. Allotype ♀.
26. *Hesp. chrysotricha leucospila,* ♀, Inverloch, Vict. Allotype ♀.
27. *Hesp. chrysotricha leucospila,* ♂, Inverloch, Vict. Holotype ♂.
28. *Hesp. chrysotricha leucospila,* ♂, Inverloch, Vict. Holotype ♂.

All figures from retouched photographs. Fig. 25 is the underside of fig. 26 and fig. 28 the underside of fig. 27. Photographs of figs. 1-24 by Miss A. G. Burns, and figs. 25-28 by Mr. J. Clark.